

Protect Thyself: How Affective Self-Protection Increases Self-Interested Behavior

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## Protect Thyself: How Affective Self-Protection Increases Self-Interested, Unethical Behavior

### Abstract

In this research, we draw on the characteristics of disgust—an affective state that prompts a self-protection response—to demonstrate that experiencing disgust can also increase self-interested, unethical behaviors such as cheating. This series of studies contributes to the literature demonstrating context-specific effects on self-interested, unethical behavior. Specifically, we show that innocuous emotion-eliciting cues can elicit a focus on the protection of one's own welfare, leading people to engage in self-interested behaviors that are unethical. This research provides evidence that the importance of clean physical environments may extend beyond visual beautification of surroundings to include economic behaviors.

**Keywords:** self-interested behavior; unethical behavior; self-protection; disgust; emotion; cleansing

## Protect Thyself: How Affective Self-Protection Increases Self-Interested, Unethical Behavior

Scholars such as Adam Smith (1776/1904) and Hume (1748/1902) argue self-interested behavior to be the bedrock of economic progress congruent with the common good. However, some self-interested behaviors may also be unethical given their inconsistency with more desirable virtuous behavior (e.g., Aristotle's *Nicomachean Ethics* in Thomson 1955; Biblical Commandments in Browning 1879) and violation of societal norms (Treviño, Weaver, & Reynolds, 2006). Though not all self-interested behaviors are unethical, to the extent that a subset of self-interested behaviors can be unethical, our paper examines the latter. More specifically, we examine self-interested, unethical (SIU hereafter) behaviors whereby individuals cheat, thereby benefiting from being dishonest (Mazar, Amir, and Ariely 2008a, 2008b), consistent with behavioral ethics research (Treviño et al., 2006).<sup>1</sup> What causes people to engage in such SIU behaviors?

Research recognizes that SIU behaviors are sensitive to contextual factors (Gino, Schweitzer, Mead, & Ariely, 2011; Wiltermuth, 2011; Yang, Wu, Zhou, Mead, & Vohs, 2013). We add to this literature by examining how evoking an incidental affective state through physical disgust can influence SIU behavior. A large body of research shows that experiencing incidental affect influences decisions such as the amount one is willing to pay to receive or dispose of a commodity (Cryder, Lerner, Gross, & Dahl, 2008; Lerner, Small, & Loewenstein, 2004), risk estimates (Lerner & Keltner, 2001; Winterich, Han, & Lerner, 2010), and punitive damages and

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<sup>1</sup> We specify our focus is on unethical behaviors that are self-interested since some behaviors which violate societal norms and are thus deemed unethical are not self-interested (e.g., "The Heinz Dilemma" of stealing medicine to save a loved one, Kohlberg, 1963).

punishments (Lerner, Goldberg, & Tetlock, 1998). How does affect, specifically disgust, influence SIU behavior?

To answer this question, we report four studies examining the impact of physical disgust on SIU behaviors. Following past research, we denote SIU behaviors as those that are morally unacceptable to the larger community (Jones 1991, p. 367) and result in personal gain (Gino & Pierce, 2009). Our studies are important in several ways. First, we extend a growing body of research that shows the context-specific nature of SIU behaviors (e.g., Gino & Galinsky, 2012; Gino & Margolis, 2011; Gino & Pierce, 2009; John, Loewenstein, & Rick, 2013; Yang et al., 2013; Zhong, Bohns, & Gino 2010a). More generally, we extend the set of potential factors influencing SIU behaviors to people's affective states, particularly an experience of disgust. Second, we provide insight into the mechanisms through which SIU behaviors may be motivated. Specifically, we demonstrate the mediating role of a self-protection focus that arises from disgust. Third, we show how such deleterious effects can be mitigated. In so doing, we contribute to the recent interest in effects of cleansing on decision-making (Lee & Schwarz, 2011) by demonstrating how subtle activities such as evaluating cleansing products can minimize the potentially deleterious effect of experiencing disgust on SIU behaviors. Our findings show why dirty environments can have policy implications that go beyond visual beautification of physical contexts.

### **Self-Interested, Unethical (SIU) Behavior**

Empirical studies have shown the prevalence and context sensitivity of SIU behaviors. In one study, self-interested behavior increased when the bet on a dice roll was written after rather than before the throw of the dice, even when the bet was only in participants' minds and rules could not be enforced (Jiang, 2013). In another study, using email rather than paper was found to

increase the likelihood of lying to deceive others (Naquin, Kurtzberg, & Belkin, 2010). Gino and Pierce (2009) demonstrated that the presence of abundant wealth (vs. scarcity) increased overstatement of one's performance on an anagram task.

Other studies have examined the specific mechanisms through which context may operate. Yang et al. (2013) found that SIU behaviors (e.g., keeping more than half of the allocated money for oneself) in a variety of exchanges including the trust game, prisoner's dilemma, the ultimatum game, and the dictator game increased when people handled dirty (vs. clean) money. The authors proposed this dirty money effect occurred because handling dirty money lowers moral standards and reduces positive attitudes toward fairness and reciprocity, thereby increasing self-interested behavior. In another study, darkness induced by a dimly-lit (vs. well-lighted) room or through wearing sunglasses was found to increase dishonesty—a SIU behavior examined via self-reported solving of anagrams and allocations in the dictator game (Zhong et al., 2010a). The authors reasoned that this effect of darkness may occur due to a feeling of illusory anonymity. It may also be the case that individuals in a dark environment behave with greater self-interest because of an increased need for self-protection triggered by darkness.

Consistent with this research, we examine whether experiencing disgust—an affective state—might also impact SIU behavior. Specifically, we argue that experiencing disgust, as a consequence of situational factors, can trigger self-interest within an individual. This is consistent with the notion that the evolutionary origins of disgust serve as a mechanism for self-protection (Curtis, Aunger, & Rabie, 2004; Oaten, Stevenson, & Case, 2009). Our main theoretical argument is that the experience of physical disgust is a basic and primal emotion that

elicits both physiological and psychological reactions aimed at self-protection (Rozin, Haidt, & McCauley, 2000; Smith & Ellsworth, 1985).

Darwin (1872/1965) proposed that physical disgust evolved to assist an individual to engage in self-protection via activities such as food selection and disease avoidance. Stated differently, disgust serves a biological function of self-preservation. Indeed, Fessler said, "the reason we experience these reactions [disgust] today is that the response protected our ancestors," (Paul, 2010, p. 42). Consistent with this premise, an experience of physical disgust is associated with a self-protective response such as avoiding spoiled food or toxic substances (Olatunji, Haidt, McKay, & David, 2008; Rozin, Haidt, & McCauley, 2008). When Chapman, Kim, Susskind, and Anderson (2009) had participants drink small samples of disgust-inducing (i.e., bitter, salty, and sour) liquids, participants' physiological responses included an increased tightening in the throat, a decreased heart rate, and activation of the *levator labii* muscle region of the face, all characteristic of an oral-nasal response aimed at self-protection.

Typically, physical disgust is evoked via stimuli such as an unpleasant, nauseating odor (Inbar, Pizarro, & Bloom, 2012; Schnall, Haidt, Clore, & Jordan, 2008b), dirty desks (Schnall et al., 2008b), or visual exposure to fecal matter and unclean restrooms (Lerner et al., 2004). These stimuli represent a potential for harm (e.g., through disease) and are likely to evoke a self-protection response. Thus, people may be conditioned to associate the experience of physical disgust, however mild, with a potential for harm to one's self, which then triggers a more general and automatic response to engage in self-protection (Lee & Ellsworth, 2012; Rozin et al., 2000, 2008). Researchers have suggested that this automatic, self-protective response emanating from disgust is not limited to physical protection (e.g., against disease) but also extends to psychological self-protection (Haidt, Rozin, McCauley, & Sumio, 1997; Rozin & Fallon, 1987).

Rozin et al. (2000, pg. 637) go so far as to “argue for a path of development in individuals and cultures that extends from the presumed origin of disgust as a rejection response to bad tastes, in the service of protecting the body, to a full range of elicitors . . . , more appropriately described as in the service of protecting the soul.” Overall, these arguments suggest that an experience of physical disgust is likely to manifest in physiological and psychological responses that are associated with a focus on protecting one’s self.

Consistent with Rozin et al. (2000), we expect the notion of self to extend not only to the physical self, but also to one’s self interest in an economic sense of self. Given this, we argue that self-protection focus, arising from the experience of physical disgust, manifests more broadly in terms of SIU behaviors (Larrick, 1993; Maddux & Rogers, 1983; Shogren & Crocker, 1991). In general, it has been found that those motivated by self-protection will tend to put their own interest above others to the extent of increased unethical behavior (Piff, Stancato, Cote, Mendoza-Denton, & Keltner, 2012). Moreover, factors emphasizing self-interest are positively associated with unethical behaviors, at least in the workplace (Kish-Gephart, Harrison, & Treviño, 2010). Based on this, we argue that the increased focus on self-protection among people experiencing disgust should be associated with a greater likelihood among them to engage in SIU behaviors. Stated differently, we argue and expect that those experiencing disgust are more likely to act in unethical ways that promote self-interest because of their need for self-protection, compared to a control group of participants experiencing a neutral state.

### **Overview of Experimental Evidence**

These studies seek to investigate whether situational factors associated with an experience of disgust increase SIU behavior and whether this observed effect—consistent with our theorizing—is mediated via self-protection. For our theorizing about disgust increasing SIU

behavior because of self-protection to be supported empirically, individuals exposed to situational factors associated with disgust should be more likely to display SIU behaviors that we consider to be cheating because individuals themselves benefit from being dishonest. These cheating behaviors include: (1) falsely reporting the outcome of a coin flip to gain monetary incentives (Experiment 1A), (2) deceiving partners to obtain more money (Experiments 1B and 3), and (3) reporting solving unsolvable anagrams for additional pay (Experiment 2). Collectively, these studies demonstrate that an affective state of physical disgust is associated with self-interested, unethical behavior (Experiment 1A, 1B, 2, 3), and this observed effect is mediated via self-protection (Experiment 2).

In Experiment 1A, we seek to demonstrate that the percentage of individuals reporting the outcome of their coin flip that assigned them to the incentive condition will be greater than chance (i.e., 50%) only for individuals experiencing disgust. In falsely reporting the outcome of the coin flip, participants experiencing disgust are behaving unethically and in a self-interested manner because they obtain the monetary incentive by being dishonest (about the outcome of the coin flip). Experiment 1B, examines a different SIU behavior, i.e., sending a deceptive message to a partner to receive a larger portion of the monetary allocation. This SIU behavior results in enhancing one's own welfare at the expense of another's welfare. Experiment 2 uses a different SIU behavior: likelihood of reporting having solved an unsolvable anagram to obtain a bonus. Importantly, Experiment 2 provides evidence of the mediating role of self-protection in the association between disgust and SIU behavior. Finally, Experiment 3 demonstrates how the effect of disgust on SIU behaviors can be mitigated by providing an opportunity to cleanse prior to the opportunity for SIU behavior. Collectively, these four experiments use different methods

for inducing disgust as well as different forms of SIU behavior as the dependent variable to demonstrate the robustness of the effect.

## **Experiment 1A**

### *Participants and Procedure*

Participants were undergraduate students recruited through classes for which research participation was a portion of their course credit. Students participated in the study in the business school's behavioral research laboratory in groups of up to 40 participants. A total of 296 students (47% female;  $M_{\text{age}}=20.94 [1.02]$ ) participated in the study.

In all conditions, participants first completed a product evaluation study, in which they evaluated the quality of five randomly ordered supermarket products. The specific products evaluated differed by condition. In the disgust condition, the products were anti-diarrheal medicine, diapers, feminine care sanitary napkins, cat litter, and adult incontinence products. In the neutral condition, products were light bulbs, vitamins, candles, shampoo, and pens. We used this method for disgust elicitation because prior research suggests exposure to some grocery store items (e.g., diapers, diarrhea medicine) can elicit disgust since these products are used to prevent exposure to or avoid contact with toxic or disease-carrying agents resulting in the product itself eliciting disgust (Morales & Fitzsimons, 2007). A key advantage of this method of invoking physical disgust is that it is subtle, providing a more conservative test of our theorizing, and mimicking a real-life situation where individuals might experience lower levels of disgust as a result of the physical environment.

After the product evaluations, participants responded to a list of emotion words to represent how they felt while viewing the products on a 10-point Likert scale (1=not at all to

10=very much), which served as a manipulation check. The specific product evaluation questions and the complete list of emotion words are listed in the online appendix.

Next, participants completed a second study, the Trivia Game Study, regarding the influence of incentives on performance (Mullen & Nadler, 2008). This task allowed us to assess SIU behavior. Participants were informed that those assigned to the incentive condition would receive 20 cents for each correct answer on a trivia quiz with 10 trivia questions (up to \$2.00), whereas those in the no incentive condition would not receive any payment regardless of the number of correct answers. Participants were then told that assignment to the incentive condition for the trivia quiz would be determined by a coin flip. That is, participants were instructed to locate the coin at their workstation, flip the coin, and then indicate if they were assigned to the incentive condition based on whether the coin landed on heads or tails. Instructions specified that tails was the incentive condition and heads was the no incentive condition; hence, participants directly benefited from reporting “tails” as the outcome of the coin flip, but having the opportunity to cheat by falsely reporting the outcome was not made explicit. After reading the instructions, participants then quietly completed their coin flip at their workstation, indicated their condition based on the outcome of the coin flip – which was unknown to anyone other than themselves, though this was not explicitly emphasized – and began the trivia quiz. The trivia quiz questions are listed in the online appendix. Most participants correctly answered all of the questions, and the proportion of correct answers was statistically unrelated to any of the study variables.

After completing the quiz, participants were informed that the researcher could not determine the correct number of answers at this time since the trivia quiz was completed anonymously online, but that they would receive \$2.00 if they had been assigned to the incentive

condition. Each participant received a receipt with \$2.00 attached, instructing them to self-report whether they were in the incentive versus no-incentive condition. They were told to take the \$2.00 if they were in the incentive condition, or return the \$2.00 to the lab assistant if they were in the no-incentive condition. Recall that only the participant knew the real outcome of the coin flip. In other words, only the participants knew whether or not the coin flip had assigned them to the incentive or no-incentive condition.

Following this randomized response methodology (Clark & Desharnais, 1998), participants had the opportunity to cheat by assigning themselves to the incentive condition based on their self-reported coin flip. Because participants received financial compensation when they reported being in the incentive condition but not in the no-incentive condition, self-reporting their condition by coin flip presented an opportunity to cheat to obtain the \$2.00 by *falsely* reporting assignment to the incentive condition. Following Mullen and Nadler (2008; Shaw, Montinari, Piovesan, Olson, & Gino, 2013), the self-report of incentive condition was the dependent variable for self-interested behavior, since baseline probabilities for both conditions were identical at 50%. In doing so, this task uses a randomized-response technique comparing observed behavior to what would be expected by chance, providing a conservative test that eliminates social desirability behavior (Clark & Desharnais, 1998). We sought a large sample size because of the randomized response methodology employed in this study.

### *Results*

*Manipulation Check.* Participants responded to the question: “While you were viewing the products, to what degree did you experience each of the feelings below?” for a series of emotion words listed in the online appendix (1= not at all, 10 = very much). We examined responses to four words related to disgust, specifically disgusted, dirty, gross, and unclean

( $\alpha=.93$ ; Haidt, McCauley, & Rozin, 1994; Smith & Ellsworth, 1985). Participants in the disgust condition reported experiencing more disgust than those in the neutral condition ( $M_{\text{disgust}}=3.56$  vs.  $M_{\text{neutral}}=1.33$ ,  $t(294)=10.95$ ,  $p<.0001$ ). We also averaged the eleven negative affect words ( $\alpha=.91$ ) and the eight positive affect words ( $\alpha=.89$ ). As expected, participants in the disgust condition reported experiencing more negative affect than those in the neutral condition ( $M_{\text{disgust}}=2.65$  vs.  $M_{\text{neutral}}=1.83$ ,  $t(294)=5.34$ ,  $p<.0001$ ) and less positive affect ( $M_{\text{disgust}}=4.10$  vs.  $M_{\text{neutral}}=4.89$ ,  $t(294)=3.64$ ,  $p<.0001$ ). Additionally, disgust and negative affect were significantly correlated ( $r=.67$ ,  $p<.01$ ), but neither disgust nor negative affect was significantly correlated with SIU behavior ( $r_{\text{Disgust}}=.09$ ,  $p=.11$ ;  $r_{\text{Negative}}=.08$ ,  $p=.14$ ), likely due to the group-level assessment of SIU behavior.

*Percentage reporting coin flip for incentive condition (SIU behavior).* Recall that those self-reporting the incentive condition are engaging in SIU behavior if they were in the no-incentive condition based on their actual coin flip. Though we do not know the true outcome of their coin flip, the randomized response technique we employed allowed us to assess whether the self-reported incentive condition based on the chance of flipping tails (i.e., 50%) differs by disgust condition. We conducted a logistic regression with self-reported incentive condition as the dependent variable to assess the effect of disgust on self-interested behavior. Results show that the percentage reporting being in the incentive condition was greater for those in the disgust (vs. neutral) condition (63% vs. 52%, Wald  $\chi^2(1)=3.19$ ,  $p=.07$ ).<sup>2</sup> Moreover, a chi-square test for

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<sup>2</sup> At the end of each study, participants were asked what they thought the hypothesis of the study was and if they had any thoughts they wanted to share with the researchers. Two undergraduate students coded the responses (inter-rater agreement = .78) for hypothesis guessing, suspicion of the research procedure, and comprehension of the study directions. In Study 1A, given the nature of self-reporting incentive condition based on outcome of the coin flip (unknown to the researcher), 43 of 296 (14.5%) of participants indicated suspicion of the coin flip assignment to the incentive condition. One participant indicated the hypothesis as someone's mood affecting honesty. Excluding these 44 participants leaves 252 respondents for analysis, and the main effect of disgust remains (64% vs. 53%, Wald  $\chi^2(1)=2.99$ ,  $p=.08$ ). Exclusion was not predicted by emotion condition (Wald  $\chi^2(1)=1.41$ ,  $p=.23$ ).

specified proportions indicated that those experiencing disgust reported being eligible to receive the incentive significantly more than expected by chance (i.e., 63% vs. 50%;  $\chi^2(1) = 10.63$ ,  $p < .01$ ). In contrast, those in the neutral condition were no different than chance (52% vs. 50%,  $\chi^2(1) = .28$ ,  $p = .60$ ). See Figure 1.

While these results indicate a marginal effect of disgust, the disgust elicitation using real products and randomized response methodology offer a relatively conservative test of the hypothesis. Even though everyone had the opportunity to misreport their coin flip, thereby engaging in SIU behavior, only those who were experiencing disgust did so more than expected by chance. It should be noted, however, that the neutral emotion elicitation in this study may not have been as neutral as intended, as some of the products shown to participants in the neutral condition may be associated with cleanliness (shampoo) and light (light bulbs and candles). Both of these associations might reduce baseline SIU behaviors (Lee & Schwarz, 2011; Yang et al. 2013; Zhong et al., 2010a), thereby amplifying the difference in SIU behaviors between the neutral and disgust conditions. We correct for any potential bias resulting from such associations in the subsequent studies by using neutral emotion inductions that do not have these associations.

### **Experiment 1B**

Experiment 1B differs from Experiment 1A in two meaningful ways. First, Experiment 1B uses a video to induce physical disgust; the video induction provides a standardized emotion experience and differs from the manipulation used in Experiment 1A. This ensures that our results are generalizable to different contexts evoking physical disgust. Second, this experiment uses a decision-making task in which participants can choose to lie to obtain a greater reward to assess SIU behavior. This measure allows us to determine actual SIU behavior rather than calculating SIU behavior by comparison to rates of chance as done in Experiment 1A.

### *Participants and Procedure*

Undergraduate students recruited through classes for which research participation was a portion of their course credit completed the study in the behavioral research laboratory in groups of up to 12 participants. A total of 50 students (54% female;  $M_{\text{age}}=19.16$  [.55]) completed the study. First, participants were randomly assigned to watch one of two video clips described as an online entertainment survey. Video clips that have been previously used to manipulate disgust (a scene from “Trainspotting” involving a disgusting toilet) versus neutral states (a documentary about the coral reef from National Geographic) were used (Lerner et al., 2004; Schnall et al., 2008b). After watching the video, participants completed a series of filler questions regarding interest in the video, which are reported in the online appendix.

Next, following Gneezy (2005), we examined participants’ decision to be dishonest with another person to get more money. Participants were informed they would be randomly partnered with another session participant who would remain anonymous. They were told there were two payment options that they and their partner would receive after the research session (Option A: \$2 to decision maker and \$3 to other student; Option B: \$3 to decision maker and \$2 to other student). Then they were told to select one of two messages to send to their partner. In Message 1, the partner was informed Option A would earn them more money than Option B. In Message 2, Option B was stated to earn them more money than Option A. In reality, Option B resulted in \$3 to decision maker and \$2 to other student, whereas Option A resulted in only \$2 to the decision maker and \$3 to the other student. Thus, sending Message 2 provided the partner with false information so the participant (decision-maker) would get more money. That is, participants would receive \$1.00 more than their partner if they sent their partner Message 2.

Consistent with Gneezy (2005), we informed participants that their partner would only have the information sent in the message to make their decision about the option to select for payment, and they would be paid according to the option selected by their partner. We also informed participants that their partner would never know their identity, the actual sums that would be paid for each option, or the sum paid to the decision maker; thus, unlike Study 1A, anonymity as well as a lack of consequences resulting from being dishonest was emphasized to participants in the current procedure. Unbeknownst to participants, all participants were designated as Partner 1, deciding which message to send, and no participants were designated as Partner 2, deciding which option to choose for payment, since we were not interested in the extent to which participants would follow Partner 1's message.

After participants chose which message to send, they raised their hand and the lab administrator collected a slip of paper with their message choice marked, which would be used to inform their partner of the message. After several minutes, the lab administrator marked the sheet to indicate that the partner had selected the option that would give them the most money (i.e., if the participant sent Message 2, then the experimenter indicated that the hypothetical partner had selected Option B for payment). The lab administrator then returned the sheet to the participant and, upon their exit, paid them according to the option selected. Because participants received a greater payment than their partner if they sent Message 2 (which was false) and their partner followed their message (which was always the case since the partner was hypothetical), choosing to send Message 2 versus Message 1 presented an opportunity to cheat in order to obtain \$1.00 more than their partner. Thus, message choice was the dependent variable for SIU behavior. The complete study procedure is reported in the online appendix.

### *Results*

*Manipulation Check.* Participants were asked to answer a question about the video clip watched at the beginning of the survey: “While you were viewing the video, to what degree did you experience each of the feelings below?” for a series of emotion words listed in the online appendix (1= not at all, 10 = very much). We examined responses to the four disgust words: disgusted, dirty, gross, and unclean ( $\alpha=.97$ ). Participants in the disgust condition reported experiencing more disgust than those in the neutral condition ( $M_{\text{disgust}}=8.83$  vs.  $M_{\text{neutral}}=1.73$ ,  $t(48)=17.85$ ,  $p<.0001$ ). We also averaged six negative affect words ( $\alpha=.93$ ) and three positive affect words ( $\alpha=.94$ ). Not surprisingly, participants in the disgust condition reported experiencing more negative affect than those in the neutral condition ( $M_{\text{disgust}}=4.86$  vs.  $M_{\text{neutral}}=1.89$ ,  $t(48)=5.35$ ,  $p<.0001$ ) and less positive affect ( $M_{\text{disgust}}=2.15$  vs.  $M_{\text{neutral}}=5.65$ ,  $t(48)=6.51$ ,  $p<.0001$ ). Additionally, and as expected, disgust and negative affect were significantly correlated ( $r=.72$ ,  $p<.01$ ). However, disgust, but not negative affect, was significantly correlated with SIU behavior ( $r_{\text{Disgust}}=.41$ ,  $p<.01$ ;  $r_{\text{Negative}}=.16$ ,  $p=.27$ ), providing additional evidence for the specific role of disgust.

*Percentage choosing deceptive message for partner (SIU behavior).* Our theorizing predicts that individuals who had watched a disgust-inducing video to be more likely to deceive their partner than those who had watched a neutral video. To assess SIU behavior, we ran a logistic regression with message choice as the dependent variable and disgust as the independent variable. There was a significant effect of disgust on the choice of the deceptive message (Wald  $\chi^2(1)=4.94$ ,  $p=.03$ ).<sup>3</sup> Specifically, 67% of individuals in the disgust condition chose to send their

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<sup>3</sup> Similar to Study 1A, Study 1B participants responded to two open-ended questions at the end of the study, which were coded by two undergraduate students (inter-rater agreement = .91). This study also included items to ensure that participants understood the potential payment benefit based on their message choice. One of 50 participants indicated suspicion that the partner was hypothetical. Four participants were excluded for low comprehension (1 by indicating they did not understand the payment benefit of the message decision and 3 by indicating confusion in the open-ended response). Excluding these 5 participants leaves 45 respondents for analysis, and the main effect of

partner the deceptive message compared to 35% of individuals in the neutral condition sending the deceptive message. See Figure 2. Thus, when there is an opportunity to engage in SIU behavior (i.e., deception as a result of information asymmetry), disgusted individuals are more likely to engage in it than individuals in a neutral state.

### *Discussion*

Importantly, in this experiment, the effect of disgust on SIU behavior was assessed with dishonesty in a decision-making task to obtain an economic gain over another individual rather than just comparing self-reported coin flip to rates of chance. Further, different than the previous study, disgust was elicited through a video clip rather than through product evaluations used in Experiment 1A. In addition to providing generalizability by showing the same effect occurred using a different emotion induction, the neutral video clip in Experiment 1B did not have the same cleanliness and light associations that may have lowered the baseline SIU behaviors in the neutral condition in Experiment 1A, resulting in a cleaner test of the proposed theory. Thus, taken together, experiments 1A and 1B provide robust evidence that individuals who experienced disgust as a result of the situational context engaged in more SIU behavior than individuals in a neutral state.

Next we seek to replicate this result, while also examining the mediating mechanism. Specifically, we theorized that this effect of disgust on SIU behavior occurs because of self-protection among those experiencing disgust. We test this proposed mediating mechanism next.

## **Experiment 2**

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disgust remains (70% vs. 36%, Wald  $\chi^2(1)=4.78, p=.03$ ). Exclusion was not predicted by emotion condition (Wald  $\chi^2(1)=1.53, p = .22$ ).

The purpose of Experiment 2 is to examine the mediating role of self-protection using a different disgust induction as well as a different SIU behavior: reporting having solved an unsolvable anagram to obtain a bonus.

### *Participants and Procedure*

Participants were members of an online panel that received points distributed by the panel administrator for survey participation (N=120, 66% female;  $M_{\text{age}}=41.71$  [16.90]). Each participant was randomly assigned to one condition in a 2-level (emotion: disgust vs. neutral) between-subjects design. First, participants completed an essay writing task, adapted from Study 3 of Schnall et al. (2008b), which was presented as a memory study. Those in the disgust condition wrote about their most disgusting experience, whereas those in the neutral condition described their typical evening (see online appendix for complete stimuli).

Participants then completed both the problem-solving task to assess SIU behavior and reported their self-protection focus with the order of these two measures randomized.<sup>4</sup> To assess self-protection focus, we adapted three items regarding self-concern orientation from De Dreu and Nauta (2009). Participants responded to three statements which began with “At this moment,” 1) protecting my needs is at the center of my focus, 2) I am more focused on protecting myself, and 3) I am concerned about protecting my own needs and interests. Responses were on a 7-point scale (1=Not at all to 7=very much). The three items were averaged to create a self-protection index ( $\alpha = .91$ ).

The problem-solving task was an anagram task in which participants were asked to unscramble 10 jumbled words. The task was described as a study on incentives in problem-

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<sup>4</sup> Order did not attenuate the main effect of disgust condition nor did it interact with disgust condition ( $p_s > .40$  for the dependent variable of solved anagram and the mediator of self-protection focus) so we collapsed the results and do not discuss it further.

solving such that participants would be randomly assigned to receive either one bonus point for each solved word scramble in order, or 10 bonus points if they were able to unscramble the first four or more words in order. They were informed they must unscramble the words in the order in which they appear rather than skipping around between words. In reality, all participants were assigned to the second incentive condition in which they would receive 10 bonus points for solving the first four or more words in order. Unknown to participants, the third anagram was not solvable. Participants were given three minutes to unscramble as many words as possible in order. Since the study was conducted online, they were told they could use a piece of paper to unscramble the words and only needed to indicate the number of anagrams they solved in order at the end of three minutes. This setup created an opportunity for participants to falsely report the number of anagrams solved to receive the bonus points, though again, the opportunity to cheat was not made explicit, nor were the consequences resulting from being dishonest discussed. Since the third anagram was unsolvable, SIU behavior was determined by whether participants reported having solved the third anagram, which would allow them to receive the bonus. A manipulation check for the disgust induction was conducted at the end of the study along with demographic information and a suspicion probe.

### *Results*

*Manipulation Check.* At the end of the survey, participants were asked to answer a question about the memory task completed at the beginning of the survey: “Please indicate the extent to which you experienced each of the feelings below while completing the life events memory task at the beginning of this survey” for a series of emotion words listed in the online appendix (1= not at all, 10 = very much). We examined responses to the four disgust words: disgusted, dirty, gross, and unclean ( $\alpha=.96$ ). Participants in the disgust condition reported

experiencing more disgust than those in the neutral condition ( $M_{\text{disgust}}=6.01$  vs.  $M_{\text{neutral}}=1.31$ ,  $t(116)=11.20$ ,  $p<.0001$ ). We also averaged the six negative affect words ( $\alpha=.87$ ) and the three positive affect words ( $\alpha=.96$ ). Participants in the disgust condition reported experiencing more negative affect than those in the neutral condition ( $M_{\text{disgust}}=3.93$  vs.  $M_{\text{neutral}}=1.93$ ,  $t(118)=5.82$ ,  $p<.0001$ ) and less positive affect ( $M_{\text{disgust}}=2.54$  vs.  $M_{\text{neutral}}=6.16$ ,  $t(118)=7.79$ ,  $p<.0001$ ), as would be expected from the disgust elicitation. Additionally, disgust and negative affect were significantly correlated ( $r=.74$ ,  $p<.01$ ), as expected. As in Study 1B, disgust, but not negative affect, was significantly correlated with SIU behavior ( $r_{\text{Disgust}}=.27$ ,  $p<.01$ ;  $r_{\text{Negative}}=.16$ ,  $p=.08$ ), providing additional evidence for the specific role of disgust.

*Percentage reporting solving an unsolvable anagram (SIU behavior).* We conducted a logistic regression with self-reported solving of the third unsolvable anagram as the dependent variable to assess the effect of disgust on SIU behavior. We anticipated that participants who had written about a disgusting experience would be more likely to engage in SIU behavior than those who had written about their typical evening. Results revealed a significant effect of disgust (Wald  $\chi^2(1)=7.65$ ,  $p<.01$ ).<sup>5</sup> Specifically, 52% of individuals in the disgust condition reported having solved the third unsolvable anagram, i.e., SIU behavior. In contrast, only 27% of individuals in the neutral condition reported having solved this anagram. See Figure 3.

*Mediating role of self-protection focus.* To assess the role of self-protection focus, we conducted mediation analysis following Preacher and Hayes (2004) using model 4 of Hayes' (2013) process macro. We include disgust condition as the independent variable, reported

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<sup>5</sup>Following the same procedure as earlier studies, two undergraduate students coded the same two open-ended questions (inter-rater agreement = 1.00). Three participants guessed a hypothesis regarding the effect of mood on honesty, and 10 participants indicated suspicion that not all anagrams were solvable. Excluding these 13 participants leaves 107 respondents for analysis, and the main effect of disgust remains (56% vs. 24%, Wald  $\chi^2(1)=11.04$ ,  $p<.01$ ). Exclusion was not predicted by emotion condition (Wald  $\chi^2(1)=.76$ ,  $p = .38$ ).

solving of the unsolvable anagram as the dependent variable, and self-protection focus as the mediating variable. We used 5,000 iterations to derive a 95% confidence interval for the indirect effect of self-protection. Results revealed a significant indirect effect of disgust condition on reported solving of the anagram through self-protection focus (indirect effect = .17, 95% CI: .0068 to .5325). To illuminate the pattern, disgusted participants reported a greater self-protection focus ( $M_{\text{disgust}} = 4.78$ ) than those in the neutral condition ( $M_{\text{neutral}} = 4.30$ ) with this greater self-protection focus increasing the reporting of solving an unsolvable anagram.

*Discussion.* In addition to replicating the results of Experiments 1A and 1B in demonstrating that disgust increases SIU behavior, this study provides evidence for the mediating role of self-protection focus. That is, participants experiencing physical disgust reported a greater self-protection focus, which mediated the increased likelihood of engaging in SIU behavior, namely reporting having solved an unsolvable anagram to obtain a bonus. Moreover, similar to the video clip in Experiment 1B, the essay writing task in Experiment 2 is not associated with cleanliness and light (as in Experiment 1A), thereby providing a more robust test of the proposed theory.

While this study provides evidence for the mechanism underlying our theorizing, it does not answer a key question related to policy. Specifically, how, if at all, can the increase in SIU behavior from the self-protective focus induced by disgust be mitigated? We propose that an opportunity to cleanse can be one such mitigating factor.

*Can Cleansing Mitigate Self-interested, Unethical behavior?*

Recently, scholars have investigated the effects of cleansing behaviors on several outcomes (see Lee & Schwartz, 2011). Specifically, after cleansing hands with antibacterial soap or an antiseptic wipe, participants were both likely to increase leniency (Schnall, Benton, &

Harvey, 2008a) and increase condemnation (Zhong, Strejcek, & Sivanathan, 2010b) of another person's immoral act. These contrasting results were replicated when individuals were primed with cleansing through typing sentences or word scrambles (Schnall et al., 2008a; Zhong et al., 2010b). Relatedly, experiencing scents that are associated with cleanliness (e.g., citrus-scented Windex cleaner) increased reciprocity and prosocial behavior (Liljenquist, Zhong, & Galinsky, 2010). These results are consistent with Schnall (2011) who argues that cleanliness goes beyond the absence of disgust and dirtiness to serve a social function. That is, evolutionarily, cleanliness was desirable for social grooming. Drawing upon this line of thinking, we argue that a focus on cleanliness may increase feelings of safety and security due to the lowered likelihood of contamination. As such there should be a decrease in the self-protective focus of disgust given the more social motivation associated with cleanliness. Moreover, Zhong and Liljenquist (2006) found that engaging in physical cleansing after recalling one's own unethical behavior reduced feelings of self-threat. These results provide further support for our theorizing that cleansing will reduce the self-protective focus associated with disgust.

Having demonstrated that disgust increases SIU behavior through enhanced self-protection, a decrease in self-protection from cleanliness should decrease SIU behavior. Consequently, we argue that individuals who have the opportunity to cleanse themselves after experiencing disgust may be less likely to focus on self-protection—thus, they will display lower levels of SIU behaviors. Stated differently, engagement in SIU behaviors should decrease if the participants experiencing disgust have had the opportunity to cleanse.

In summary, introducing cleansing should negate the effect of disgust on SIU behavior. In doing so, we move beyond the benefits of cleanliness on prosocial behavior (Liljenquist et al., 2010) to demonstrate how cleansing can deter SIU behavior arising from the self-protective

focus when experiencing disgust. That is, cleansing opportunities may potentially deter or ameliorate the negative consequences of disgust.

### **Experiment 3**

We use the self-interested behavior from Experiment 1B in this study. We also use a very subtle psychological cleansing opportunity to provide a conservative test for examining its ability to mitigate the effects of disgust on SIU behavior.

#### *Participants and Procedure*

The procedure followed that of Experiment 1B with the addition of psychological cleansing. Participants were undergraduate students recruited through classes for which research participation was a portion of their course credit. Students participated in the study in the behavioral research laboratory in groups of up to 12 participants (N=129, 43% female;  $M_{\text{age}}=19.10$  [1.33]). Each participant was randomly assigned to one condition in a 2 (emotion: disgust vs. neutral) x 2 (cleansing: yes, no) between-subjects design.

First, participants watched one of two videos used in Experiment 1B to elicit either disgust or a neutral state. Then participants completed a cleansing product evaluation task similar to Zhong and Liljenquist (2006). Participants were told: “To aid local stores in most effectively stocking their shelves for college students, we are interested in how desirable different products are to college students. Please indicate how desirable each product is to you at this time” (1=completely undesirable to 7=completely desirable). Participants were randomly assigned to evaluate either non-cleansing products or products related to cleansing. In the cleansing condition, participants indicated the desirability of Lysol disinfectant wipes, Windex window cleaner, Tide detergent, Purell hand sanitizer, and Dove body wash. In the non-cleansing

condition, participants indicated the desirability of Post-it notes, BIC pens, Oreos, Energizer batteries, and Glad sandwich bags.

After reporting product evaluations, participants completed the same decision-making task used in Experiment 1B that assessed SIU behavior by being dishonest with another participant to obtain more money, which made the opportunity to cheat explicit and emphasized anonymity and the fact that there would be no negative consequences resulting from being dishonest. The procedure was identical to Experiment 1B and the same items were included to ensure that participants understood the potential payment benefit based on their message choice, the extent to which they perceived their partner would follow their decision, and a suspicion probe.

### *Results*

*Manipulation Check.* Participants were asked to answer a question about the video clip watched at the beginning of the survey: “While you were viewing the video, to what degree did you experience each of the feelings below?” for a series of emotion words listed in the online appendix (1= not at all, 10 = very much). We examined responses to the four disgust words: disgusted, dirty, gross, and unclean ( $\alpha=.98$ ). Participants in the disgust condition reported experiencing more disgust than those in the neutral condition ( $M_{\text{disgust}}=8.44$  vs.  $M_{\text{neutral}}=1.33$ ,  $t(99)=20.92$ ,  $p<.0001$ ). We also averaged the six negative affect words ( $\alpha=.85$ ) and the three positive affect words ( $\alpha=.92$ ). Participants in the disgust condition reported experiencing more negative affect than those in the neutral condition ( $M_{\text{disgust}}=5.48$  vs.  $M_{\text{neutral}}=1.51$ ,  $t(99)=13.45$ ,  $p<.0001$ ) and less positive affect ( $M_{\text{disgust}}=2.07$  vs.  $M_{\text{neutral}}=6.50$ ,  $t(99)=12.00$ ,  $p<.0001$ ), as would be expected from the disgust elicitation. We note the degrees of freedom are lower because not all participants were able to complete all of the measures in the research session.

*Percentage choosing deceptive message for partner (SIU behavior).* We expected that when participants had the opportunity to cleanse through reported preferences for cleansing-related products, disgust would not increase SIU behavior. However, when participants did not have the opportunity to cleanse, we would replicate the effect of disgust on SIU behavior demonstrated in earlier experiments.

We ran a logistic regression with SIU behavior as the dependent variable and disgust, cleansing condition, and their interaction as the independent variables. Neither emotion condition nor cleansing condition had a significant main effect ( $p > .25$ ). However, results revealed a marginally significant interaction (Wald  $\chi^2(1)=3.04, p=.08$ ).<sup>6</sup> In the non-cleansing products condition, disgusted individuals demonstrated more SIU behavior through greater likelihood of deception than those in the neutral emotion condition (53% vs. 30%,  $Z = 1.87, p = .06$ , two-tailed). In the cleansing-products condition, SIU behavior was statistically identical between those who were disgusted and those in the neutral emotion condition (35% vs. 43%,  $Z = .63, p = .53$ ), as theorized. See Figure 4. These results indicate that cleansing can mitigate the deleterious consequences of disgust manifested as SIU behavior.

### General Discussion

This research demonstrates contextual factors (such as shopping for different products, watching a video, or describing past life incidents) that can induce incidental, physical disgust increase SIU behaviors such as being dishonest about the outcome of a coin flip to obtain a

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<sup>6</sup> Following the same procedure as earlier studies, two undergraduate students coded the two open-ended questions (inter-rater agreement = .70), and the study also included items to ensure that participants understood the potential payment benefit based on their message choice. No participants indicated suspicion that the partner was hypothetical, but 15 participants indicated low comprehension (4 by indicating they did not understand the payment benefit of the message decision and 11 by indicating confusion in the open-ended response). Excluding these 15 participants leaves 114 respondents for analysis, and the focal interaction becomes significant (Wald  $\chi^2(1)=4.19, p=.04$ ). In the non-cleansing products condition, disgusted individuals demonstrated more SIU behavior (57% vs. 28%,  $Z = 1.99, p < .05$ ). In the cleansing-products condition, SIU behavior did not differ by emotion (34% vs. 43%,  $Z = .65, p = .52$ ). Emotion, product condition, nor the interaction predicted exclusion ( $p > .10$ ).

monetary incentive, deceiving another individual to obtain a larger monetary allocation than the other individual, and falsely reporting the solution to an anagram to obtain a bonus. We show that a self-protection focus mediates the effect of disgust on SIU behavior (Experiment 2). A final study (Experiment 3) shows that when individuals have the opportunity to cleanse the increase in SIU behaviors is mitigated. Specifically, when disgusted individuals have the chance to psychologically cleanse—rating the desirability of cleansing products—after disgust is elicited, there is no difference in the likelihood of deceiving their partner for their own gain. However, consistent with the first 3 experiments, when individuals experience disgust but not an opportunity to cleanse, they are more likely to deceive their partner for their own personal gain.

Notably, although consistent in the overall pattern of results, the effects of disgust on SIU behaviors differ in magnitude across the four experiments. One possibility for these differences is the likelihood that participants believed they could “get away with it,” or the potential penalty associated with the SIU behavior. Indeed prior work indicates that one of the main predictors of cheating behavior is the potential gain or penalty associated with the given behavior (Rick and Loewenstein 2008; Mazar et al., 2008a). Consistent with this premise, we obtained the highest rates of cheating in the two studies where it was most clear that participants would not get caught in their dishonesty (Experiments 1B and 3). Additionally, Mazar et al. (2008b) note that individuals are more likely to cheat when they can maintain a positive self-concept, which can occur when their cheating is anonymous. In Experiments 1B and 3, where we found the highest rates of cheating, it was not only clear to participants that they were being given the opportunity to cheat in their message choice, but it was also emphasized that their identity would not be revealed to their partner. In the cheating measures used in Experiments 1A and 2, which resulted in lower rates of cheating, it was not clear that there was an opportunity to cheat and we did not

emphasize anonymity so participants may have been concerned that the researcher would catch them cheating, which would not only result in negative consequences but would also lower their self-concept. Nevertheless, the differences in the magnitude of effect sizes suggests that additional contextual factors should be investigated to understand why people are more or less likely to cheat in relatively similar, yet subtly different circumstances.

Collectively, these results go beyond being the first demonstration of the impact of contextually induced affect, specifically disgust, on SIU behaviors—they articulate the mechanism through which SIU behaviors manifest. Though prior research has indicated that SIU behavior may increase under conditions of darkness due to a feeling of illusory anonymity (Zhong et al. 2010a) or that dirty money lowers moral standards and decreases fairness and reciprocity, increasing SIU behavior (Yang et al., 2013), we demonstrate that disgust can increase SIU behavior due to an increased focus on self-protection. There is an emerging literature in decision theory and economics examining the role of self-protection motives, particularly linking it to protection against the downside and risk taking (Larrick 1993). Our findings suggest that there may be ways in which affect, risk taking, and SIU behaviors are linked. We hope future research studies can examine this possibility. At the same time, our results also provide alternative explanations for previous findings. For example, if handling dirty money results in feelings of disgust, our findings suggest that this decrease in standards of fairness and reciprocity may have occurred due to an increased concern for self-protection. Thus, future research should also examine specific conditions when one or the other mechanism is more likely to operate.

It is important to situate this research, which addresses the relationship between disgust and SIU behavior, in the broader context of research regarding disgust and morality. Researchers

(Pizarro, Detweiler-Bedell, & Bloom, 2006; Sherman & Haidt, 2011) make a strong case that a person's affective state shapes their morality, supporting the demonstrated link between disgust and judgments of SIU behavior. More specifically, much research regarding disgust and morality has focused on moral judgments (Dasgupta, DeSteno, Williams, & Hunsinger, 2009; Eskine, Kacirik, & Prinz, 2011; Inbar, Pizarro, Knobe, & Bloom, 2009; Wheatley & Haidt, 2005) rather than actual behaviors. In other words, the focus of previous studies has been to demonstrate a positive relationship between disgust and judgments regarding the immorality of unethical behavior: compared to neutral participants, those experiencing disgust make more severe judgments (i.e., judge unethical behaviors to be more wrong; Horberg, Keltner, Oveis, & Cohen, 2009; Schnall et al., 2008b; Wheatley & Haidt, 2005). Given these results, one may suggest that the elicitation of physical disgust in our studies will increase the perceived severity of SIU behavior, decreasing the likelihood of such behavior. Though we did not find this pattern, there are several factors that may underlie this difference. We enumerate them next with the idea that more research is required to compare and reconcile the findings from these research streams examining behaviors of and judgments by individuals experiencing disgust.

First, prior research examining judgments focuses on participants judging very extreme unethical, even taboo, behaviors (i.e., incest, eating a pet dog) rather than the more minor behaviors examined in the present research (i.e., cheating to get a small monetary bonus, deceiving another for a small economic gain). Second, while our research has demonstrated how people experiencing disgust *behave*, past research has focused on how people experiencing disgust *judge someone else's behavior*. Though they may seem similar, these are conceptually distinct constructs (Billings & Scherer, 1988; Einhorn & Hogarth, 1981; Pronin, Gilovich, & Ross, 2004; Tetlock, 1992), often resulting in divergent patterns of results, particularly in the

moral domain (Batson, Kobrynowicz, Dinnerstein, Kampf, & Wilson, 1997; Barkan, Ayal, Gino, & Ariely, 2012; Valdesolo & DeSteno, 2007). Third, judgments not only differ from behavior, but judgments of other people's behavior compared to judgments of one's own behavior are qualitatively different constructs. Specifically, our findings are consistent with recent work by Cohen, Wolf, Panter, and Insko (2011) that demonstrates the importance of distinguishing between evaluative and behavioral responses to experienced emotions.

Though empirically examining the distinct effects of disgust on judgments versus behaviors is beyond the scope of the current research, one possibility is that the self-protection focus of disgust may motivate individuals to protect their own welfare by both engaging in self-interested behavior and simultaneously judging others more harshly for engaging in behaviors that are harmful to society. Recent work in consumer psychology has shown that when people are depleted, they are more likely to evoke a self-protective motivation that leads them to prefer products associated with keeping them safe (Lisjak & Lee, 2014). However, the role of depletion and the self-protective motivation on judgments of other people's behaviors were not examined. We believe examining the distinct effects of disgust as well as depletion and other factors that trigger a self-protective motivation on the potential convergence and divergence of one's own SIU behavior versus judgments of other's SIU behavior is an interesting area for future research.

It is important to note that this research focuses specifically on incidental physical disgust without directly examining the effect of other specific negative emotions (i.e., anger, sadness) on SIU behavior. Drawing upon cognitive appraisal theory which delineates the distinct cognitive appraisals of specific emotions (Lerner & Keltner, 2001; Smith & Ellsworth, 1985) and has demonstrated that disgust has effects distinct from that of other negative emotions such as sadness on economic decisions (Lerner et al., 2004), we suggest that the effect identified in the

present research is unique to the specific emotion of disgust. However, future research should elicit specific negative emotions such as sadness, fear, anger, and guilt to provide a direct comparison for the effect of disgust versus other negative emotions on SIU behavior and decision-making more generally as examined in past research (Raghunathan & Pham, 1999). Moreover, research could compare the effect of disgust with that of specific positive emotions such as happiness and hope given that appraisals of positively valenced emotions align with those of negatively valenced emotions (Lerner & Keltner, 2001). For example, given that appraisals of certainty and situational control are similar among disgust, anger, and happiness, we propose that anger and happiness may have similar effects on SIU behavior reported here, but different from that of emotions such as sadness and hopefulness.

Another limitation of the current work is the dichotomous nature of the cheating (SIU) behavior across all studies. As prior research has demonstrated that even honest people often cheat a little (Mazar et al., 2008b), providing participants with multiple opportunities to cheat would be beneficial in future research. For example, rather than giving participants the opportunity to falsely report having solved one unsolvable anagram, we could use the matrix task from prior research (Mazar et al., 2008b) that gives participants the opportunity to cheat on 10 different questions, which would provide a continuous measure of SIU behavior. While such a measure may offer additional insights, we believe the significant effects obtained on dichotomous measures of SIU behavior is a more conservative test and would expect the current pattern to hold for continuous measures as well.

Regarding policy, our results suggest that unclean environments that can potentially evoke disgust—dirty workplaces, classrooms, stores, restrooms, everyday products that are associated with disgust—can also lead to more SIU behaviors. Many SIU behaviors, especially

the kind of behaviors we investigated, can be pervasive. To the extent that cleanliness—even if psychologically enacted—can wipe out the deleterious effects of physical disgust on SIU behaviors, there are interesting policy implications. Specifically, cleanliness may be more beneficial than just enhancing appearance, improving hygiene, or even increasing pro-social behavior; it may mitigate SIU behaviors. Cleaning inner-city neighborhoods ridden with graffiti, trash, and feral dogs may reduce contextual elicitations of disgust, thereby lowering the prevalence of SIU behaviors. If environments prone to disgust experiences can increase the prominence of cleansing opportunities, such as by having hand sanitizers readily available, the likelihood of SIU behaviors may decrease. These issues may be investigated in large field studies as part of future research. We hope such studies will also expand our understanding of different affective states as antecedents as well as explicating the difference between judgments and behaviors.

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Figure 1: Effect of disgust on SIU behavior (Experiment 1A)

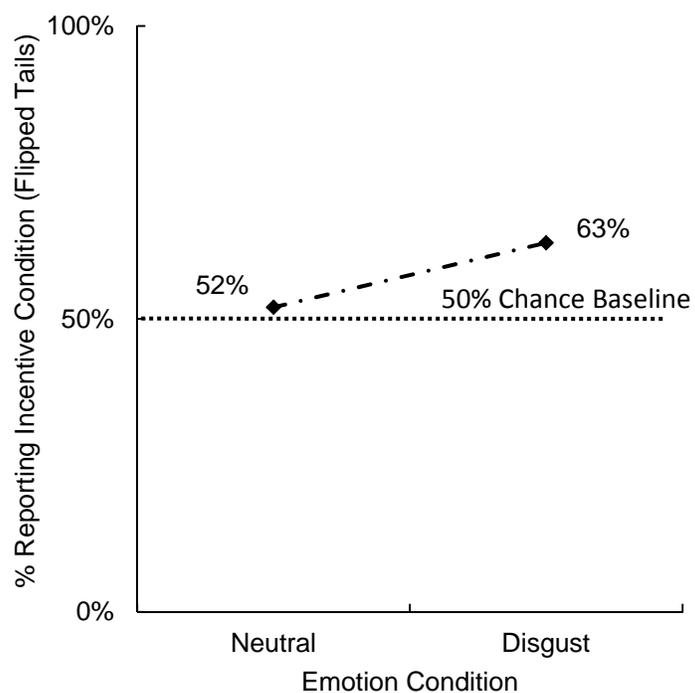


Figure 2: Effect of disgust on SIU behavior (Experiment 1B)

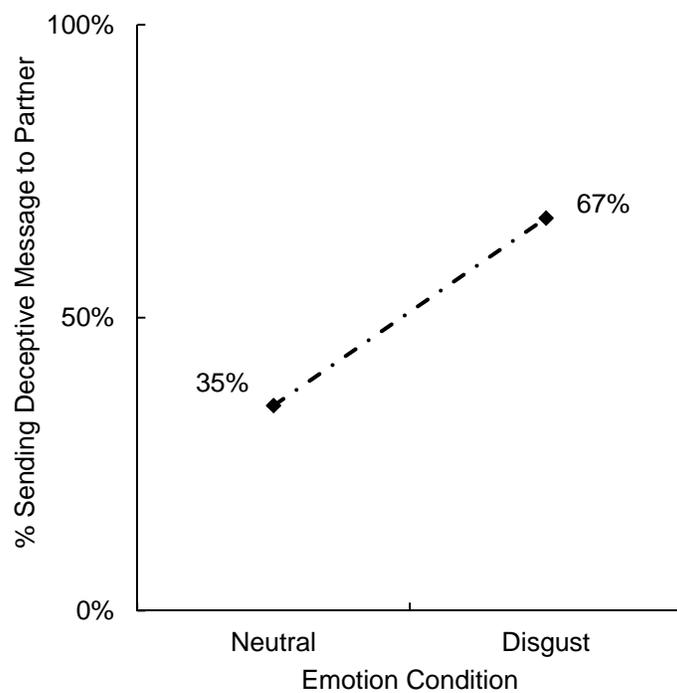


Figure 3: Effect of disgust on SIU behavior (Experiment 2)

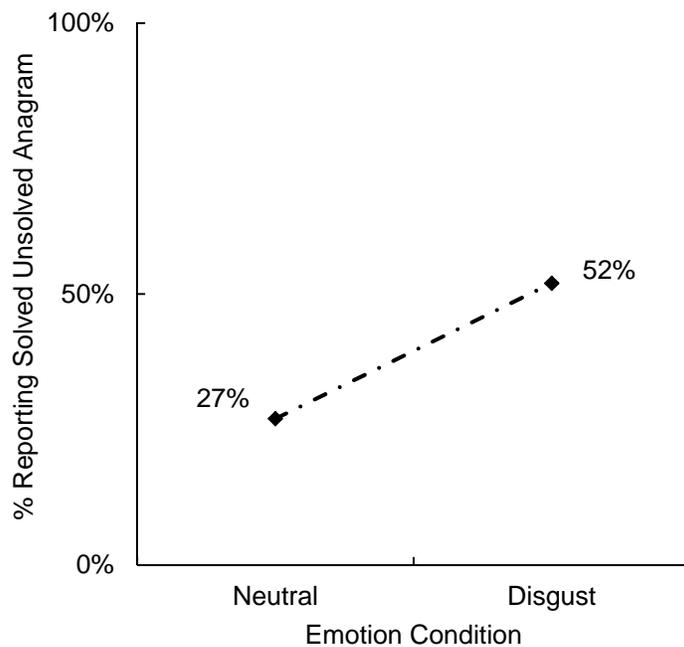
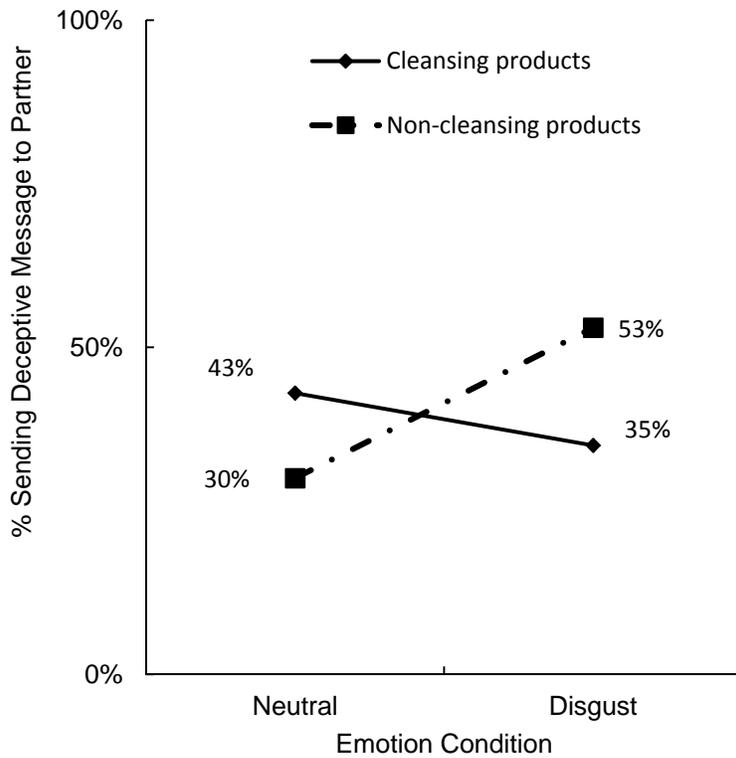


Figure 4: Moderating role of cleansing on effect of disgust on SIU behavior (Experiment 3)



**Online Appendix**

**Protect Thyself: How Affective Self-Protection Increases Self-Interested, Unethical Behavior**

### Experiment 1A Procedure

Part I: Product Evaluation Study: Participants evaluated each of five products, presented in random order, on the following five items on a 7-point scale: What is your overall impression of this product? Bad/Good; Negative/Positive; Undesirable/Desirable; Unfavorable/Favorable; Dislike/Like

While you were viewing the products, to what degree did you experience each of the feelings below? (1= not at all, 10 = very much) Angry, Annoyed, Appreciative, Bad, Comfortable, Content, Dirty, Disgusted, Distrustful, Frustrated, Good, Gross, Guilty, Happy, Negative, Pleased, Positive, Regretful, Sad, Shameful, Skeptical, Thankful, and Unclean

Part II: Trivia Game Study: The researchers of this study are interested in the effects of incentives on task performance. To examine this, some participants will receive an incentive for their participation on the trivia quiz and others will not. You will be asked to complete several trivia questions.

At your workstation is a quarter. When directed to do so on the next screen, you will need to flip the coin ONE TIME to determine if you are in the incentive or no incentive condition. If your coin lands on HEADS, you will not earn any money for each correct answer on the trivia quiz. If your coin lands on TAILS, you will earn 20 cents for each correct answer on the trivia quiz. There will be 10 trivia questions so if you are randomly assigned to the incentive condition (TAILS), you will earn up to \$2.00.

Please pick up the quarter on your desk now. Please flip it QUIETLY in your hand or on your lap. Please flip your coin ONE TIME NOW. Recall that if the coin landed on HEADS, you will not earn any money. If the coin landed on TAILS, you will earn 20 cents for each correct answer on the trivia quiz, up to \$2.00. What was the result of your coin flip? Heads (No Incentive) Tails (Incentive)

On the following pages, there will be 10 trivia questions. Please indicate the appropriate answer if you can. If you do not know the answer, please continue to the next question.

1. What is the freezing point of water in degrees Fahrenheit?
2. What is the boiling point of water in degrees Celsius?
3. How many grams are there in a kilogram?
4. How many minutes are there in an hour?
5. How many hours are there in a day?
6. How many milliliters are there in a liter?
7. How many inches are there in a foot?
8. How many millimeters are there in a meter?
9. How many meters are in one kilometer?
10. How many millimeters are there in centimeter?

Thank you for completing this study on incentives on task performance. At this time, we do not know the actual number of correct responses you had since you completed the quiz anonymously online. However, if you were in the incentive condition, you will receive \$2.00 for your participation. Please raise your hand now and the experimenter will bring you your \$2.00 payment if you were in the incentive condition and then direct you to the next study.

On paper, with \$2.00 attached, delivered to each participant by lab administrator: Were you in the incentive condition? Yes No If Yes, complete the receipt below and take your \$2.00 payment.

### Procedure for Experiments 1B and 3

Part I: Film and Advertising Study: For the first part of today's session, you are going to watch a video clip. Researchers are interested in how college students view a variety of different types of films. After you view the video clip, we will ask you to answer a couple of questions about the experience.

To begin, please put on the headphones at your computer station.  
[viewed either disgust or neutral condition film clip]

How much did you enjoy the film that you watched? (1=not at all, 7=very much)  
How much did you feel like you could relate to the film that you watched? (1=not at all, 7=very much)  
How appropriate do you think the film was for college students? (1=not at all, 7=very much)  
Off the top of your head, what are three different companies/products that might be able to successfully advertise during the video clip that you watched previously?

Part II: This is a short experiment in decision making. In this experiment, you will be randomly matched with another participant in this research session. Neither of you will ever know the identity of the other. The money that you earn will be paid to you at the end of the session, privately and in cash.

Two possible monetary payments are available to you and your partner in the experiment. The two payment options are:

Option A: \$2 to you and \$3 to the other student

Option B: \$3 to you and \$2 to the other student

The choice rests with the other student who will have to choose either option A or option B. The only information your partner will have is information sent by you in a message. That is, he or she will not know the monetary payments associated with each choice.

We now ask you to choose one of the following two possible messages, which you will send to your partner.

Message 1: "Option A will earn you more than Option B."

Message 2: "Option B will earn you more than Option A."

We will show the other student your message and ask him or her to choose either A or B.

To repeat, your partner's choice will determine the payments in the experiment. However, your partner will never know what sums were actually offered in the option not chosen (that is, he or she will never know whether your message was true or not). Moreover, he or she will never know the sums to be paid to you according to the different options. We will pay the two of you according to the choice made by your partner based on the message you sent to him or her.

Below, please indicate if you understand the directions? Specifically, do you understand that you will be choosing to send one message (A or B) to your partner and they will never know your identity or the monetary amounts of each option?      [Yes]    [No]

Now, below we will ask you to indicate the message you want to send to your partner.

Recall the two payment options are:

Option A: \$2 to you and \$3 to the other student

Option B: \$3 to you and \$2 to the other student

To repeat, your partner will never know what sums were actually offered in the option not chosen (that is, he or she will never know whether your message was true or not). Moreover, he or she will never know

the sums to be paid to you according to the different options. We will simply show the other student your message and ask him or her to choose either A or B.

From past research, we know that over 80% of the time the partner chooses the option that is stated in the message you send to earn him or her more. Therefore, if you send Message 2, there is over an 80% chance that your partner will select Option B, earning you \$3 and them \$2.

Below, please indicate the message you wish to send to your partner.

Message 1: "Option A will earn you more than Option B."

Message 2: "Option B will earn you more than Option A."

There is a white slip of paper at your station. Please turn it over and circle the message that you chose to send to your partner. Please raise your hand and the lab administrator will collect your paper so they can inform the partner of your message. After your partner selects the option, they will return the paper to you and you will be paid at the end of the research session.

Do NOT advance to the next screen until the lab administrator has collected your paper.

Thank you for completing this decision-making task. After the lab administrator gives your message to your partner and he or she selects an option, the lab administrator will return the paper to you with the option your partner selected. In the meantime, please continue to complete the other tasks in the research session by clicking below.

We would like to ask you a few questions about the video clip you watched at the beginning of this survey. While you were viewing the video, to what degree did you experience each of the feelings below? (1= not at all, 10 = very much) Angry, Dirty, Disgusted, Frustrated, Good, Gross, Guilty, Happy, Negative, Positive, Sad, Shameful, and Unclean

## Experiment 2 Procedure

Part I: The first short task will ask you to recall an event in your life. We are interested in how people remember events, so please try to recall the event in as much detail as possible. We may ask you some questions about this event later in the survey.

*GENERAL INSTRUCTIONS: Provide as much detail as you can and take your time, but you do not need to spend more than 2-4 minutes on this question.*

(Disgust condition): Question 1. What are the 3-5 things that make you find most disgusting? Please write two-three sentences about each thing that makes you disgusted. (Disgust often arises when you experience something very unpleasant with an aversive physical reaction to avoid the stimulus and perhaps even nausea. Examples of things you might write about include: using a dirty toilet, seeing a dead animal, eating spoiled food, etc.)

Now we'd like you to take a minute to think about each of the situations described above and determine the one experience that has been the most disgusting experience of your life. Once you have carefully considered this situation, please continue to the next page.

Question 2. Thinking about the one experience that has been the most disgusting in your life, please begin by writing down what you remember of the disgusting event, and continue by writing as detailed a description of the event as is possible. You may want to close your eyes as you recall this memory so you can visualize how things looked, smelled, and/or tasted. Please try to imagine the event as vividly as possible and relive the feelings you experienced at the time of this event.

IF YOU CAN, PLEASE WRITE YOUR DESCRIPTION SO THAT SOMEONE READING THIS MIGHT FEEL PHYSICALLY DISGUSTED JUST FROM LEARNING ABOUT THE SITUATION. What is it like to be in this situation? What did the situation look like? What smells or tastes were there? Why does it make you so disgusted?

*You do not need to take more than 3-5 minutes to complete this question.*

(Neutral condition): Question 1. What are the 3-5 activities that you did today? Please write two-three sentences about each thing that you select. (Examples of things you might write about include: getting ready in the morning, eating lunch, going to work, running errands, etc.)

Now we'd like you to take a minute to think about the activities that typically occur in your evening and determine the way that you most typically spend your evening. Once you have carefully considered your typical evening, please continue to the next page.

Question 2. Thinking about the way you typically spend your evening, please begin by writing down a description of your activities, and then figure out how much time you devoted to each activity. Examples of things you might describe include preparing dinner, eating dinner, spending time with family or friends, running errands, watching TV, etc.

If you can, please write your description so that someone reading this might be able to reconstruct the way in which you, specifically, spend your evenings.

*You do not need to take more than 3-5 to complete this question.*

Note: We gave participants instructions on the length of time to spend on each question to limit the variance inherent in this type of emotion elicitation. For example, if participants spend an excessive amount of time writing, they may inadvertently start to describe and experience other emotions, whereas too short of time writing about the emotion experience will result in a very weak elicitation of the emotion.

## Part II: Use of Incentives in Problem-Solving

The researchers of this study are interested in the effects of incentives on problem-solving. To examine this, participants will be randomly-assigned to receive different incentives for unscrambling jumbled words. In the next task, you will be asked to unscramble 10 jumbled words and will be assigned to one of two incentive conditions.

Incentive Condition #1: You will receive 1 bonus point for each scrambled word you can solve in order.  
 Incentive Condition #2: You will receive 10 bonus points (double the points for a completed survey) if you are able to solve the first 4 or more scrambled words in order.

You must solve the word jumbles in the order they appear. If you successfully unscramble the first three word jumbles but not the fourth, you will only be awarded the bonus points for solving the first three words--even if you also successfully unscramble the fifth, sixth, and seventh word jumbles.

Please continue to the next page to see your randomly-assigned incentive condition.

### Incentive Condition Assignment

You have been assigned to Incentive Condition: 2

Recall that in this incentive condition, you will receive 10 bonus points if you are able to solve the first 4 or more scrambled words in order. In other words, if you solve more than 4 word jumbles in order, you will automatically earn 10 bonus points. Do you understand your incentive condition? [Yes] [No]

On the next screen there are 10 scrambled words. You will have three minutes to unscramble as many words as you can in order. The time at the top of the screen counts down from three minutes. Remember that you need to solve the word jumbles in order as you will only be paid for the number solved in order. You can use a sheet of paper to try to unscramble the words, but please do not use any software for word jumbles. Once you have solved a word jumble, please check the "Solved" box, and move on to solve the next word jumble. After 3 minutes have passed, please enter the number of correctly solved word scrambles in order at the bottom of the page.

Remember that you need to solve the word scrambles in order and report only the total number solved which were completed in order. Do you understand the directions?

Time remaining in minutes: 03:00 (Counter on screen counted down from 3 minutes)

Please solve as many word scrambles as you can in the order listed below in the next three minutes.

1. Unhted
2. Eoshu
3. Unaagt (unsolvable)
4. Ythoird
5. Olarc
6. Jnipmug

7. Hgitwe
8. Claslou
9. Yomseevld
10. Rbedai

How many word jumbles did you solve in order? (please only enter a numerical value from 0-10)

Thank you for completing this part of the study on incentives in problem-solving.  
Please continue to complete the remaining parts of this survey.

We would like to ask you a few questions about the memory task you completed at the beginning of this survey. Please indicate the extent to which you experienced each of the feelings below while completing the life events memory task at the beginning of this survey (1= not at all, 10 = very much): Angry, Annoyed, Dirty, Disgusted, Frustrated, Good, Gross, Guilty, Happy, Negative, Positive, Sad, and Unclean